MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

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Maryland Roadside Tree Care Expert Exam Study Guide

For Exam Domain:

Chapter 5: Tree Pruning

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Pruning is defined as the selective removal of plant parts. The objective is to produce strong, healthy, attractive plants. To obtain the defined objective, consider the growth cycle of the species, the structure of the species, and the type of pruning to be performed.

No tree should be pruned without first establishing clearly defined objectives. The location and size range of parts to be removed shall be specified before pruning begins. Some **objectives** include:

- Reduce risk of failure;
- Provide clearance;
- Reduce shade and wind resistance;
- Maintain health;
- Improve a view;
- Improve aesthetics.

Specifications for pruning are based on the objectives and should include:

- Location of parts to be removed;
- Size range of parts to be removed;
- Pruning objectives;
- Pruning types to be used.

No branch should be removed without a reason. Some reasons for pruning include:

- **Safety (Hazard Mitigation)** Remove branches that could fail and cause injury or property damage. Remove branches to increase light penetration if the area is too dark.
- **Health** Remove branches that are diseased, contain insect-infested wood, are crossing or rubbing, and to increase air flow.
- **Aesthetics** Remove branches to enhance the natural form and character of the tree or to stimulate flower production.

Producing strong structure should be the emphasis when pruning young trees. Remove only broken and dead branches when first planted. In one or two years, after the tree has become established, remove no more than 25% of the canopy in one year. Consider removing defects, establishing a single dominant leader, and spacing branches well along the main trunk.

The five steps in training a young tree:

1. Remove broken, dead, dying or damaged branches.
2. Select and establish a **dominant leader**.
3. Select and establish the lowest **permanent branch**.
4. Select and establish **scaffold branches**.
5. Select and subordinate **temporary branches**.

As trees mature, the aim of pruning will shift to maintaining tree structure, form, health and appearance. Consider:
The site where the tree is located,

- The time of year when the tree will be trimmed,
- Tree species and how well that species responds to pruning,
- The size of the tree and its branches and trunk,
- The growth habit of the species,
- The vitality of the tree and its ability to withstand the stress of pruning,
- The age of the tree.

Proper pruning cuts are made at a node, the point at which one branch or twig attaches to another. Always cut back to a lateral that is at least 1/3 the size of the parent limb so that it may assume apical dominance. In all tree pruning no more than 25% of the crown may be removed in any one year.

PRUNING TYPES

The six types of pruning cuts are:

1) Crown thinning
2) Crown raising
3) Crown reduction
4) Crown cleaning
5) Crown restoration
6) Utility pruning

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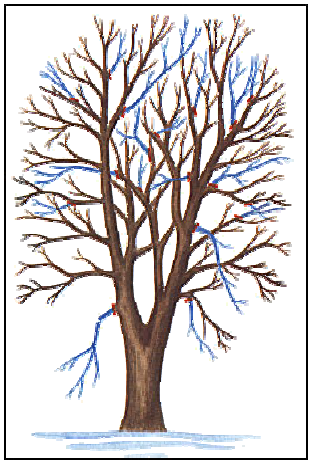
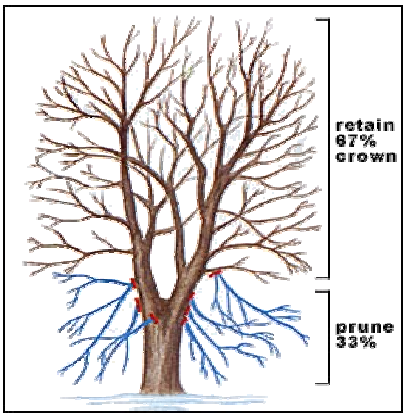
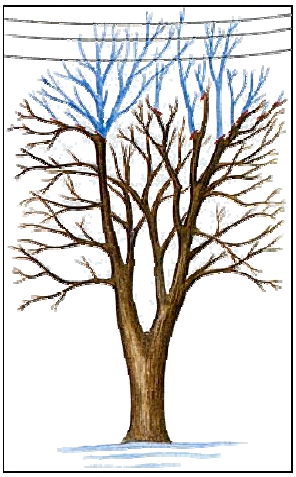


Crown thinning (right graphic) is done to increase light, increase air flow, and reduce tree weight. The location and size range of parts to be removed shall be specified before pruning begins.



Crown raising, or elevating, (left graphic) is the selective removal of the lower branches to provide clearance for such things as buildings, signs, vehicles, pedestrians, and lines of site. The clearance should be specified

before any cutting is done. After pruning, the ratio of the living crown to total tree height should be at least two-thirds. Crown raising is the pruning type often used by public highway departments to provide clearance for pedestrian and vehicle traffic.



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Crown reduction (right graphic) is the selective removal of upper branches to reduce tree height, reduce tree spread, and reduce weight. Again, clearance should be specified before trimming is done. Cut the limb back to its origin or back to a lateral capable of assuming apical dominance. When cutting back to a lateral, bisect the angle between the branch bark ridge and an imaginary line perpendicular to the leader or the branch being removed. This is called a **drop-crotch cut**.

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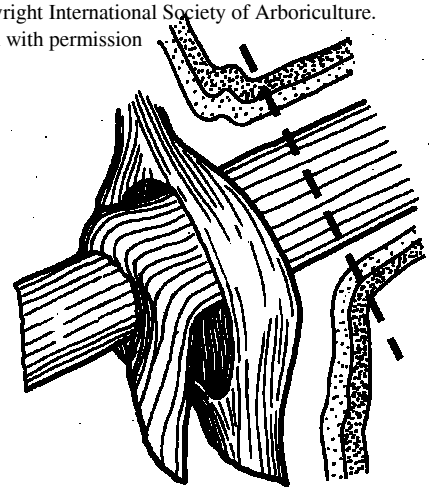
Crown cleaning (to the left) is the selective removal of deadwood, diseased limbs, broken branches, and weakly attached branches.

Crown restoration includes pruning of branches in trees that have been topped or damaged in a storm to help improve crown structure and appearance. This would include the selective removal of water-sprouts, all stubs, and all dead branches.

Utility pruning is done in trees planted too close to utilities in order to prevent loss of service and prevent damage to the utility.

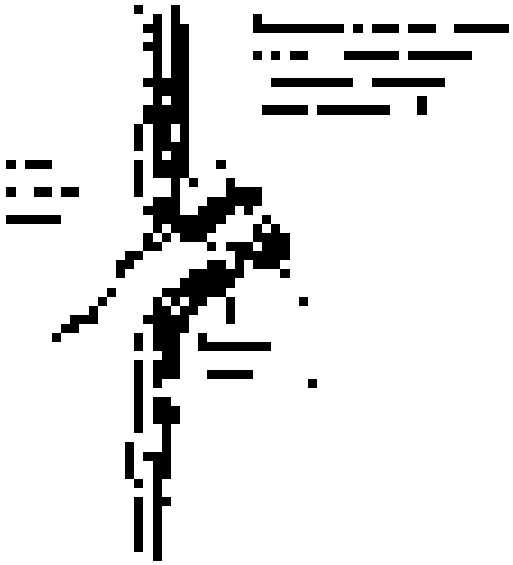
PRUNING CUTS

A pruning cut should be made close to the trunk or parent limb without cutting into the branch bark ridge or collar and without leaving a stub. Natural-target pruning should be used for live branches as this removes only the tissue of the target branch and does not damage the branch collar. Proper pruning allows for a developmental process unique to trees that allows them to compartmentalize decay.



C**ompartmentalization** is the process by which trees limit the spread of discoloration and decay. After a tree is pruned, reactions are triggered to form boundaries around the wounded area. A model of this process is called **CODIT** = **C**ompartmentalization **O**f **D**ecay **I**n **T**rees.

The pruning of small branches should be made with sharp tools just outside the branch bark ridge and angle down away from the stem of the tree. It is generally recommended that you use sharp by-pass clippers instead or the anvil type to make a clean cut and not crush branch tissue.



Large cuts requiring saws should be supported by one hand when possible. If you can not support the branch with one hand, then use the **three-cut technique.** The first cut (A) eliminates the chance of tearing the bark when the limb is removed. The second cut (B-C) allows the limb to drop smoothly when is weight is released. The third cut (D-E) just outside the branch collar removes the remaining stub.

When removing a dead branch or stub, remove only the dead tissue and make the final cut (D-E) just outside the collar of living tissue. Avoid damaging any of the live tissue.

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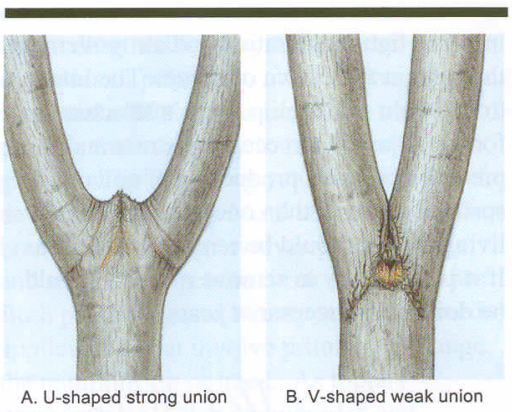
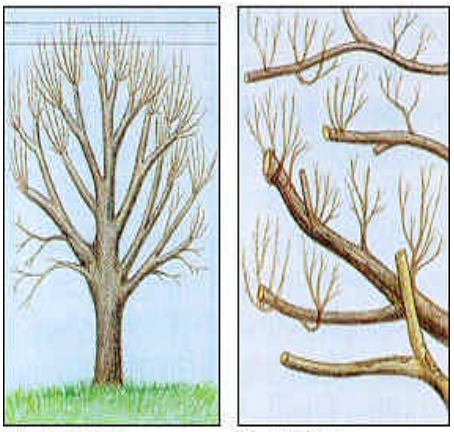


Codominant stems are prone to failure as the tree grows larger. One of the stems should be cut back or removed if possible allowing the other to assume dominance. Codominant stems with V-shaped crotches and branches with sharp-angled branch attachments should be removed. These V-shaped angles often form included bark and create a wedge of in-rolled bark between them producing a weak

attachment. Branches with strong U-shaped attachment should be retained.

A final cut that removes a branch with a narrow angle of attachment should be made from the outside of the branch to prevent damage to the parent limb.



Topping and **Tipping** pruning practices are considered harmful to trees. Directional pruning, lateral pruning, or drop-crotch pruning should be used in crown reduction, not topping (sometimes improperly called pollarding). Stubs left from topping usually decay. The shoots that are produced below the cut are weakly attached and often become a hazard as they grow larger and heavier.

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Lions-tailing is the removal of the inner branches along a larger branch that makes the limb prone to breakage. It can be an energy drain on the tree.

Conifers may be pruned any time of the year. Pruning during the dormant season may minimize sap and resin flow from the wound. Avoid heading back to older wood with no foliage, this usually causes the branch stub to die. Hardwood trees and shrubs without showy flowers should be pruned in the dormant season to see the tree structure, maximize wound closure in growing season, reduce chance of transmitting disease from tree to tree, and discourage sap flow from wounds. Hardwood trees and shrubs with showy flowers can also be pruned in the dormant season but trees that flower in early spring (redbud, dogwood, etc.) should be pruned immediately after flowering. Trees and shrubs that flower in the summer and fall should always be pruned during the dormant season to discourage sap flow from wounds. Dead branches can be removed any time of the year.

Remember, the objective of pruning is to produce strong, healthy, attractive plants. By understanding how, when, and why to prune, and by following a few simple principles, this objective can be achieved.